

ABSTRACT

Quantum computing in a one-dimensional array of qubits limited to nearest-neighbor couplings is optimized using reordering of output qubits, reordering of operations, and simultaneous operations. Efficient implementations of logical gates useful for several designs of quantum computers reduce the time required for quantum computations. Taking account of the possibility of performing simultaneous operations on distinct qubits, efficient networks realizing the quantum Fourier transform are presented as illustration of the method.